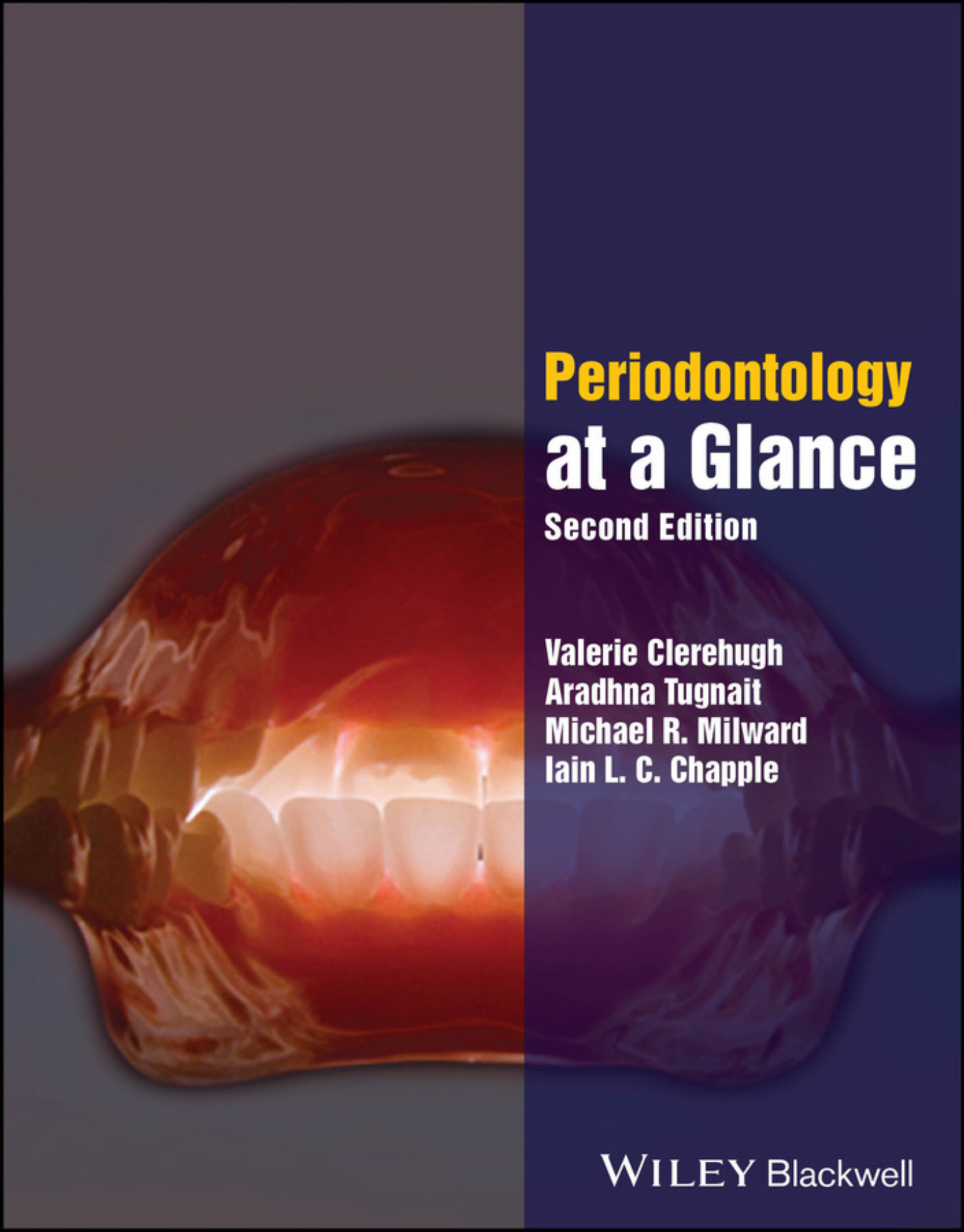




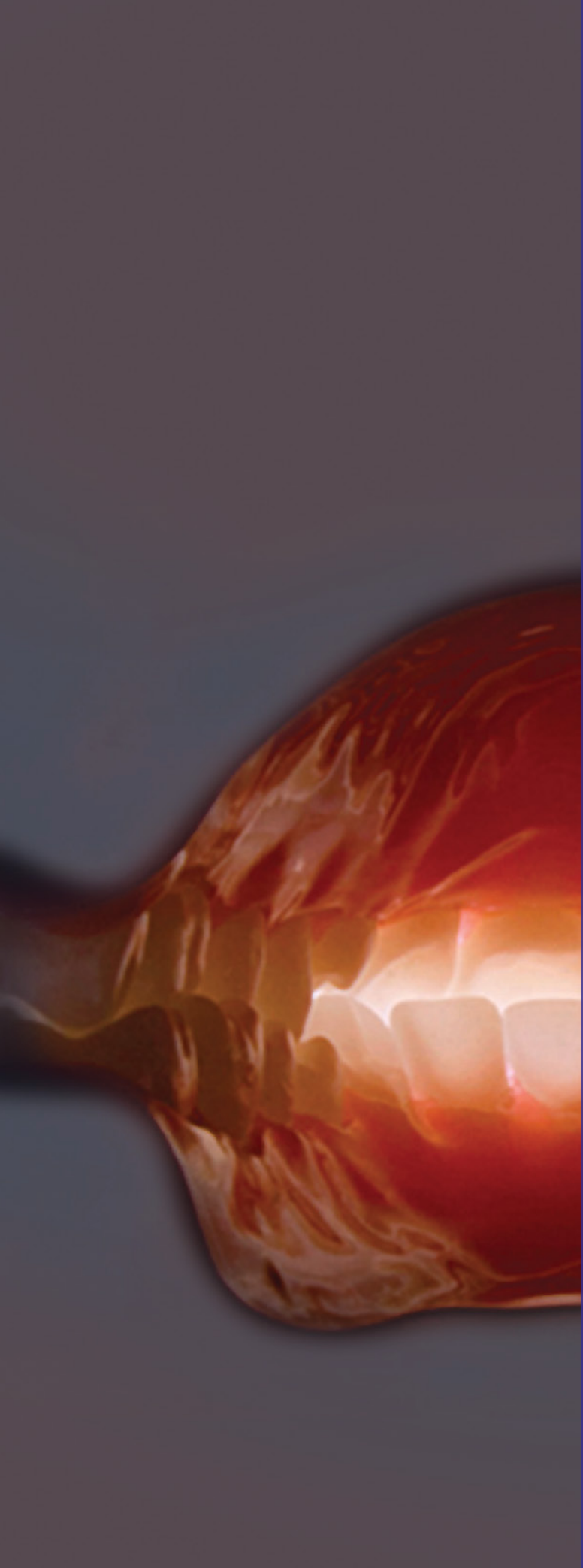
Periodontology at a Glance

Second Edition

**Valerie Clerehugh
Aradhna Tugnait
Michael R. Milward
Iain L. C. Chapple**

WILEY Blackwell

Periodontology at a Glance



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Second Edition

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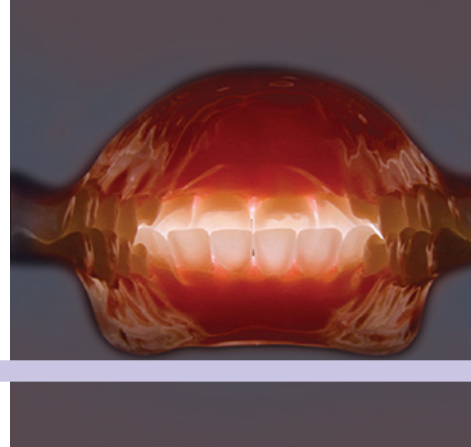
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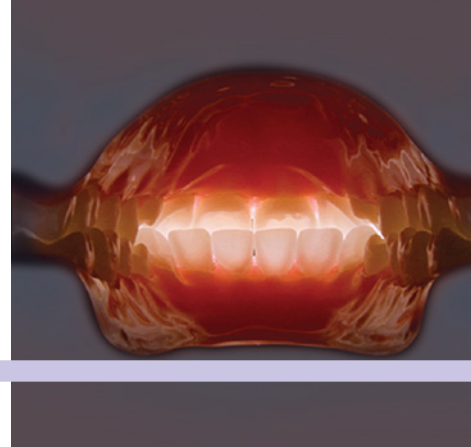
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Preface to the second edition



Periodontology, as the specialty of dentistry concerned with diseases of the supporting tissues of the teeth, is an exciting and constantly developing field. Periodontal diseases are widespread. From 1990 to 2019, there was an 8.44% increase in the prevalence rate of severe periodontitis worldwide. In 2022, the World Health Organisation estimated the prevalence of severe periodontitis globally was 19%, with 1.1 billion people affected. As such, any practitioner of dentistry or dental hygiene and therapy will be confronted with patients presenting with periodontal problems on a daily basis. Current research suggests that periodontal diseases are also linked to other general health problems including diabetes mellitus, atherosclerotic cardiovascular diseases, stroke, rheumatoid arthritis, chronic kidney disease, nosocomial respiratory infections, adverse pregnancy outcomes, Alzheimer disease and certain cancers. Thus, periodontal diseases and their management may have effects beyond that of the oral cavity.

In the UK and US, as in other countries, periodontal care is delivered in general dental practice, specialist periodontal practice and the dental hospital setting. Perhaps more than any other area of dentistry at the time of writing, the management of periodontal patients is often achieved by an integrated dental team. The continuing development of the roles of professions complementary to dentistry can only enhance the scope for delivery of effective patient care.

Periodontology at a Glance, 2nd edition, is the latest title in the widely known and popular 'At a Glance' series. After the success of the first edition, we were thrilled and honoured to be approached by Wiley to write this second edition. It is designed to provide a concise and current review of the field of periodontology and peri-implant diseases and conditions and includes the underpinning principles of these subjects and their clinical periodontal applications. It is designed as a study aid and revision guide for students of dentistry, hygiene and therapy. It is also a useful tool for dental practitioners, hygienists and therapists to update their knowledge of this continually developing subject.

While preparing this second edition, we were deeply saddened by the untimely death of our dear friend, colleague and co-editor Professor Robert Genco who was a true inspiration and an international icon in the field of periodontology. However, it is with huge pleasure and delight that we welcome Professor Iain Chapple and Professor Michael Milward as co-editors of this second edition alongside Professor Valerie Clerehugh and Dr Aradhna Tugnait.

In the typical visual 'At a Glance' style, this book uses a two page spread/short chapter format for each topic. Salient information

has been distilled from the literature and presented in easy-to-read notes, tables, diagrams and figures. Where teeth are referred to in the text and figures, the following notation is used: UR, upper right quadrant; UL, upper left quadrant; LR, lower right quadrant; and LL, lower left quadrant. The permanent teeth are referred to as '1' (indicating central incisor) to '8' (indicating third molar), to give UR1 as the upper right permanent central incisor and UR8 as the upper right permanent third molar.

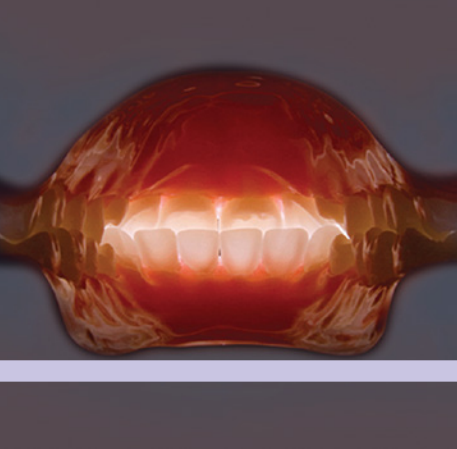
The chapters are self-contained and can therefore be read in any order. Cross-referencing will direct the reader to additional relevant chapters in the book. Each chapter ends with a box of key points to present the reader with the essential take-home messages for a particular topic. References and further reading for each chapter are provided in Appendix 5 at the end of the book.

Periodontology at a Glance has been thoroughly updated since the first edition and incorporates the latest 2018 classification findings following the 2017 World Workshop on the Classification of Periodontal and Peri-implant Diseases and Conditions, which was convened jointly by the European Federation of Periodontology (EFP) and the American Academy of Periodontology (AAP) to align and update the classification with current understanding of periodontal and peri-implant diseases and conditions. The book also includes the EFP S3-level treatment guideline and the British Society of Periodontology and Implant Dentistry (BSP) implementation of this for Stages I–III periodontitis.

We have divided our second edition into six parts, each starting with a short overview of content and with its own unique colour code, designed to enhance the visual appeal of the book and facilitate the reader's journey through the different topics: Part 1 provides the core *Foundations*; Part 2 covers *Risk and periodontal diseases* – the four chapters on risk originally authored by Bob Genco have kindly been further updated for this edition by Iain Chapple while retaining the essence of Bob's original texts, for which our heartfelt thanks; Part 3 addresses the steps in *Reaching a periodontal diagnosis and treatment plan*; Part 4 focuses on the *Fundamentals of periodontal patient care* relevant to all patients; Part 5 features *Advanced periodontal patient care: periodontal surgery; dental implants; periodontal-orthodontic interface*; and finally, Part 6 includes a diverse range of pertinent periodontal clinical topics covering *Periodontal diseases and periodontal management*.

We have loved writing the second edition of *Periodontology at a Glance* and we truly hope you enjoy using this book.

From the Editors: Professor Valerie Clerehugh, Dr Aradhna Tugnait, Professor Michael R. Milward and Professor Iain L. C. Chapple.



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We acknowledge the many colleagues who provided figures for *Periodontology at a Glance*:

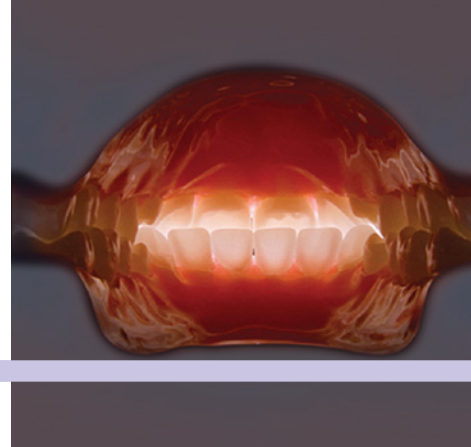
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This book was originally inspired in collaboration with our original dear Senior Commissioning Editor, Caroline Connelly. We are very grateful to our current Managing Editor, Bhavya Boopathi, for her help, support and enthusiasm in bringing the book to fruition, to Monica Rogers, before her, for encouraging us to keep our momentum going with our beloved book, and to the wider Wiley team for their help in getting us to our publication goal. We wish to thank Devipriya Somasundaram for taking care of the Permissions for us and Holly Regan-Jones for her meticulous copyediting skills. It has been a joy to work with Adalfin Jayasingh, our Content Refinement Specialist and to see the printed magic he has created from the materials we have supplied him with. Susan Engelken and her team did a splendid job producing our front cover, and the ongoing support and advice from Fraser Dart in his role as Associate Editor has been very much appreciated. A huge amount of hard work has gone into the preparation and production of the second edition of *Periodontology at a Glance* and we acknowledge with gratitude the dedication and craftsmanship of all involved.

Dedications



This book is dedicated to the memory of the late Bob Genco, who was our dear friend, colleague and co-editor of the first edition of *Periodontology at a Glance*. He was a true global icon who was revered in the world of periodontology and inspired us all. It was an honour to have known him and work with him. We are immensely proud of his contribution to our book and we look back fondly and with gratitude at his words of encouragement, wisdom and guidance throughout our publication journey together. We salute you, Bob Genco.

Professor Val Clerehugh wishes to thank her daughter Mary and son-in-law Adam, her sister and brother Carolyn and John, stepsons Jonathan and Antony, and all her family, for their love

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- 1 Anatomy of the periodontium 2**
- 2 Classification of periodontal diseases 4**
- 3 Periodontal epidemiology 8**
- 4 Role of plaque in the aetiology of periodontal diseases 12**
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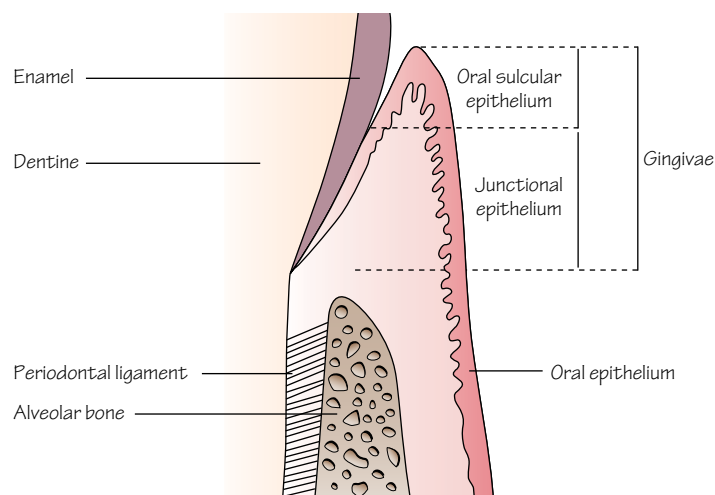
Overview

Part 1 lays the foundations for the book and covers the basic sciences relevant to periodontology. The chapters begin with the anatomy of the periodontium, then a concise schematic update of the 2018 classification of periodontal diseases, based on the 2017 World Workshop Classification of Periodontal and Peri-implant Diseases and Conditions (Chapter 2), followed by key aspects of periodontal epidemiology (Chapter 3). The next two chapters incorporate updates in our understanding of the role of plaque in the aetiology of periodontal diseases and plaque biofilm microbiology, including the principles of symbiosis and dysbiosis and the latest theories underpinning these (Chapters 4, 5), followed by core aspects of calculus (Chapter 6). The final three chapters in Part 1 present thoroughly updated but concise accounts of host defences, the development of periodontal disease and progression of periodontitis (Chapters 7–9).

1

Anatomy of the periodontium

Figure 1.1 Longitudinal section through part of a tooth showing healthy periodontal tissues.



The gingiva is made up of the gingival epithelium and connective tissue. The gingival epithelium comprises oral epithelium, oral sulcular epithelium and junctional epithelium.

Figure 1.2 Dentogingival fibres, alveolar crest fibres and circular fibres in the gingival connective tissue.

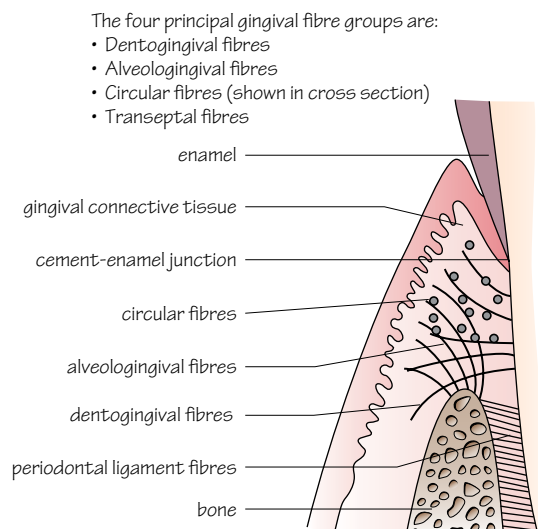


Figure 1.3 Interdental area showing transeptal and circular fibre groups in the gingival connective tissue.

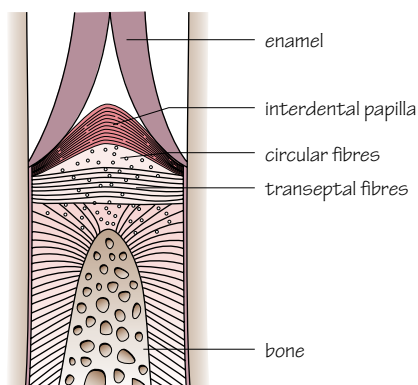
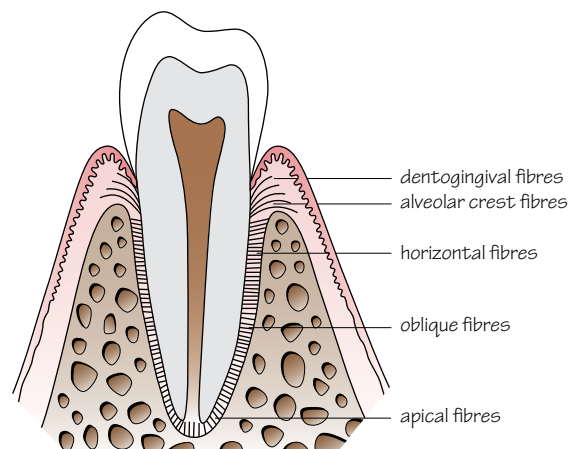


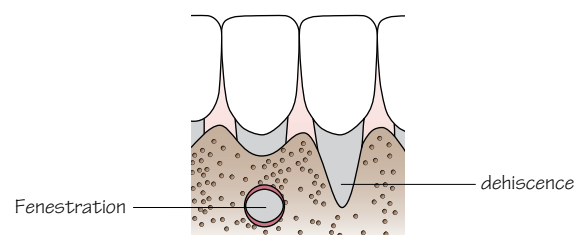
Figure 1.4 The periodontal ligament.



The four periodontal ligament fibre groups are:

- Alveolar crest fibres
- Horizontal fibres
- Oblique fibres
- Apical fibres

Figure 1.5 Bony fenestration and dehiscence.



In most situations these areas of missing bone remain undetected as they are covered with soft tissue. They may be clinically significant if associated with loss of soft tissue resulting in gingival recession (Chapter 32).

The periodontal tissues form the supporting structures of the teeth. The principal components of the periodontium are shown in Fig. 1.1:

- Gingivae (including epithelium and connective tissue).
- Periodontal ligament.
- Cementum.
- Alveolar bone.

Gingivae

The gingivae in health are pink and firm with a knife-edge appearance, scalloped around the teeth. In certain ethnic groups the gingivae may be pigmented. In health, the gingival margin is a few millimetres coronal to the cement–enamel junction. The gingival sulcus (or crevice) is a shallow groove which may be between 0.5 and 3 mm in depth around a fully erupted tooth. The gingival tissues are keratinised and appear paler pink than sites of non-keratinised oral epithelium.

Gingival epithelium

The gingival epithelium comprises (Fig. 1.1):

- Oral epithelium (OE).
- Oral sulcular epithelium (SE).
- Junctional epithelium (JE).

The gingival sulcus is lined by SE and JE.

Oral epithelium

- The OE is an orthokeratinised, stratified, squamous epithelium.
- Surface cells lose their nuclei and are packed with the protein keratin.
- It presents an impermeable physical barrier to oral bacteria.

The basal layer of epithelial cells is thrown up into folds overlying the supporting connective tissue. These folds increase the surface area of contact between the epithelium and connective tissue and are known as rete ridges or rete pegs.

Oral sulcular epithelium

- There are no rete ridges.
- Cells are keratinised but still have nuclei (parakeratinised).

Junctional epithelium

- The JE forms a specialised attachment to the tooth via:
 - a hemidesmosomal layer within the JE cells;
 - a basal lamina produced by the epithelial cells.
- The JE is non-keratinised and has a very fast turnover of cells (2–6 days compared to 1 month for OE).
- The most apical part of the JE lies at the cement–enamel junction in health.
- The JE at its widest point is 20–30 cells thick coronally.
- The JE tapers until it is only one cell in width apically.
- The JE is permeable with wide intercellular spaces through which cells and substances can migrate (such as bacterial toxins or host defence cells).
- Migration of the JE from its position in health apically onto the root cementum indicates a loss of periodontal attachment and progression to the disease state of periodontitis.

Gingival connective tissue

The gingival connective tissue (or lamina propria) is made up of collagen fibre bundles called gingival fibres, around which lie ground substance, fibroblasts, blood and lymph vessels and neural tissues. The four fibre groups are shown in Figs 1.2 and 1.3.

Periodontal ligament

The periodontal ligament forms the attachment between the cementum and alveolar bone. It is a richly vascular connective tissue within which lie bundles of collagen fibres; these are divided into four groups based on their position (Fig. 1.4).

Within the ligament are mechanoreceptors that provide sensory input for jaw reflexes. Cells from the periodontal ligament are involved in the formation and remodelling of alveolar bone and cementum. The periodontal ligament acts to dissipate masticatory forces to the supporting alveolar bone and its width, height and quality determine a tooth's mobility.

Cementum

Cementum is a mineralised tissue overlying the root dentine. It does not undergo physiological remodelling but is continuously deposited throughout life. Cementum is classified into two types:

- Acellular.
- Cellular.

Acellular cementum

Acellular cementum forms on root dentine during root formation and tooth eruption. Fibres inserted from the periodontal ligament are mineralized within the cementum and are known as Sharpey's fibres and are abundant in acellular cementum.

Cellular cementum

Cellular cementum lies over the acellular cementum. It contains cells called cementocytes which lie in lacunae. The cellular cementum layer is thicker in the apical region of the root where it is between 0.2 and 1 mm thick.

Alveolar bone

- The walls of the sockets are lined with a layer of dense bone called compact bone, which also forms the buccal and lingual/palatal plates of the jaw bones.
- In between the sockets and the compact jaw bone walls lies cancellous bone that is made up of bony trabeculae.
- The compact bone plates of the jaws are thicker on the buccal aspect of the mandibular molars and thinnest on the labial surface of the mandibular incisors.

The thickness of the compact bone layer is relevant to the choice of local analgesia techniques as the anaesthetic solution passes through bone to reach the nerve supply. The thin bone, particularly in the lower incisor region, can manifest as incomplete bony coverage in the form of fenestrations and dehiscences (Fig. 1.5).

The tooth sockets are lined with compact bone within which the principal fibres of the periodontal ligament are inserted. This area of bone can appear as a dense white line called the lamina dura on a radiograph.

Key points

- Gingivae
 - JE forms the specialised attachment to the tooth
 - The most apical part of JE lies at the cement–enamel junction in health
 - Supported by connective tissue containing collagen fibre bundles
- Periodontal ligament
 - Forms attachment between the cementum and bone
- Cementum
 - Mineralised and deposited continuously
- Alveolar bone
 - Compact and cancellous bone
 - Periodontal ligament fibres inserted into compact bone lining the tooth sockets

2

Classification of periodontal diseases

Box 2.1 World Workshop 2018 Classification of Periodontal and Peri-implant Diseases and Conditions

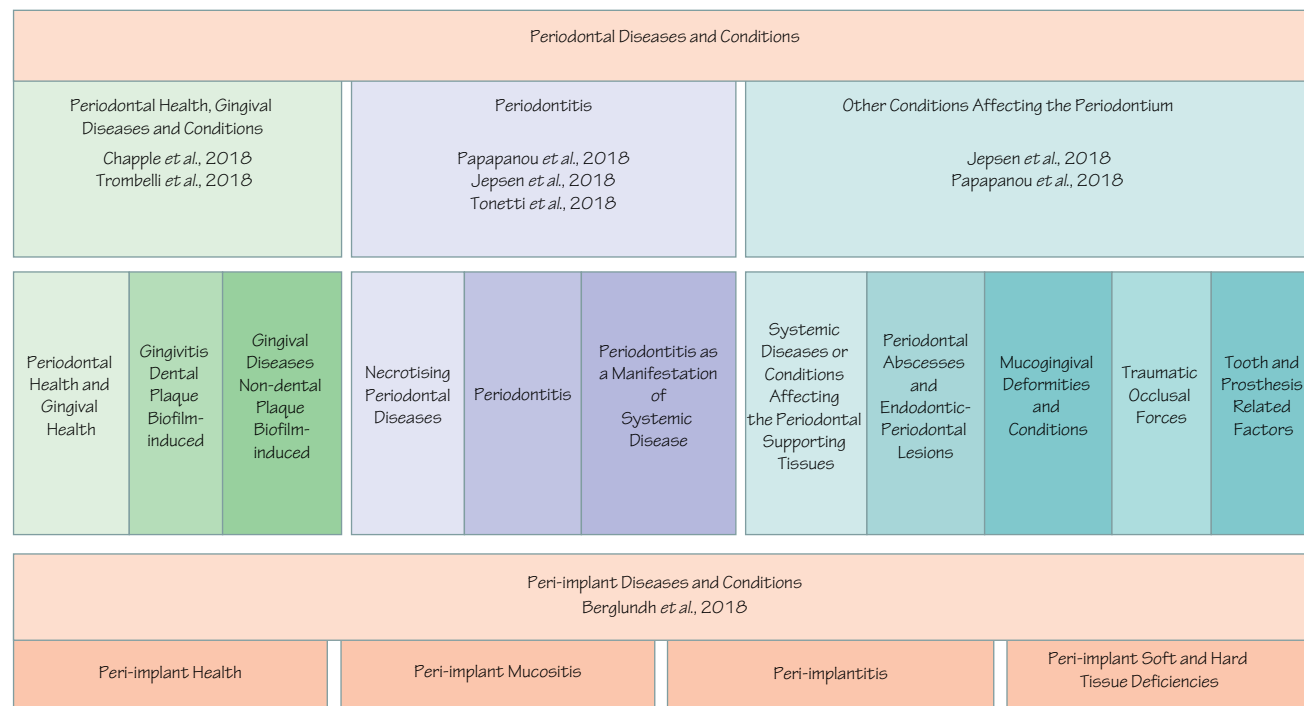
An up-to-date classification:

- allows the clinician to be aware of the full range of periodontal and peri-implant diseases and conditions that can affect the patient.
- provides a basis for the diagnosis and subsequent management of the patient.

The 2018 classification¹ in Figures 2.1–2.8

- derives from the 2017 World Workshop on the Classification of Periodontal and Peri-implant Diseases and Conditions (Caton *et al.*, 2018), which was convened jointly by the European Federation of Periodontology (EFP) and American Academy of Periodontology (AAP)
- replaces the previous 1999 classification scheme (Armitage, 1999).
- was intended to align and update the classification with current understanding of periodontal and peri-implant diseases and conditions.
- comprises three main categories of periodontal diseases and conditions, and includes four categories of peri-implant diseases and conditions that were introduced for the first time (Fig. 2.1).

Figure 2.1 2018 Classification of periodontal and peri-implant diseases and conditions. Source: Adapted from Caton *et al.* (2018).



¹ Foot note: Although the World Workshop took place in 2017, the proceedings were published in 2018. To avoid confusion, the official decision was made to call it 'the 2018 classification' henceforth whilst acknowledging it emanated from 'the 2017 World Workshop on the Classification of Periodontal and Peri-implant Diseases and Conditions'. This convention of nomenclature will be adopted throughout Periodontology At A Glance, edition 2.

Figure 2.2 (a) 2018 Classification: periodontal health and gingivitis – dental plaque biofilm induced. Source: Adapted from Chapple *et al.* (2018), Table 2. (b) Abridged 2018 classification: gingival diseases: non-dental plaque induced. Source: Adapted from Chapple *et al.* (2018), Table 2. For unabridged version, see Appendix 1.

(a)

Periodontal health:

- A. Clinical health on an intact periodontium
- B. Clinical gingival health on a reduced periodontium
 - i. Stable periodontitis patient
 - ii. Non-periodontitis patient

Gingivitis - dental plaque biofilm-induced:

Intact periodontium

Reduced periodontium in non-periodontitis patient

Reduced periodontium in successfully treated periodontitis patient

- A. Associated with plaque biofilm alone
- B. Mediated by systemic or local risk factors
 - i. Systemic risk factors (modifying factors)
 - (a) Smoking
 - (b) Hyperglycaemia
 - (c) Nutritional factors
 - (d) Pharmacological agents (prescription, non-prescription and recreational)
 - (e) Sex steroid hormones
 - Puberty
 - Menstrual cycle
 - Pregnancy
 - Oral contraceptives
 - (f) Haematological conditions
 - ii. Local risk factors (predisposing factors)
 - (a) Dental plaque biofilm retention factors (eg prominent restoration margins)
 - (b) Oral dryness
- C. Drug-influenced gingival enlargement

(b)

Gingival diseases: non-dental plaque-induced:

- A. Genetic/developmental disorders
 - i. Hereditary gingival fibromatosis
- B. Specific infections
 - i. Bacterial origin
 - ii. Viral origin
 - iii. Fungal origin
- C. Inflammatory and immune conditions
 - i. Hypersensitivity reactions
 - ii. Autoimmune diseases of skin and mucous membranes
 - iii. Granulomatous inflammatory lesions (orofacial granulomatoses)
- D. Reactive processes
 - i. Epulides
- E. Neoplasms
 - i. Premalignancy
 - ii. Malignancy
- F. Endocrine, nutritional & metabolic diseases
 - i. Vitamin deficiencies
- G. Traumatic lesions
 - i. Physical/mechanical trauma
 - ii. Chemical (toxic) burn
 - iii. Thermal insults
- H. Gingival pigmentation
 - i. Melanoplakia
 - ii. Smoker's melanosis
 - iii. Drug-induced pigmentation (antimalarials, minocycline)
 - iv. Amalgam tattoo

Figure 2.3 (a) 2018 Classification of periodontitis. (b) 2018 Classification of necrotising periodontal diseases (NPDs). Source: Adapted from Papapanou *et al.* (2018), Table 2.

(a)

- **Necrotising periodontal diseases**
- **Periodontitis**
- Staging and Grading required
- **Periodontitis as a manifestation of systemic disease**
- Rare systemic disorders like Papillon-Lefèvre Syndrome with early presentation of severe periodontitis are grouped as 'Periodontitis as a Manifestation of Systemic Disease' and classified by primary systemic disease
- Other systemic conditions eg neoplasms affecting the periodontium independent of plaque-induced periodontitis are grouped as 'Systemic Diseases or Conditions that Affect the Periodontal Supporting Tissues' (see Fig 2.4, also Appendix 2)
- All should follow the primary disease classification according to the International Statistical Classification of Diseases and Related Health Problems (ICD) codes

Note: Clinical cases of periodontitis without characteristics of necrotising periodontitis or that are not a manifestation of systemic disease should be diagnosed as 'periodontitis' and further characterised with Staging and Grading

(b)

Category	Patients	Predisposing conditions	Clinical condition
Necrotising periodontal diseases in chronically, severely compromised patients	In adults	HIV+/AIDS with CD4 counts <200 and detectable viral load	NG, NP, NS, Noma. Possible progression
		Other severe systemic conditions (immunosuppression)	
	In children	Severe malnourishments	
		Extreme living conditions	
		Severe (viral) infections	
Necrotising periodontal diseases in temporarily and/or moderately compromised patients	In gingivitis patients	Uncontrolled factors: stress, nutrition, smoking, habits	Generalised NG. Possible progression to NP
		Previous NPD: residual craters	
		Local factors: root proximity, tooth malposition	Localised NG. Possible progression to NP
	In periodontitis patients	Common predisposing factors for NPD	NG. Infrequent progression
			NP. Infrequent progression

Key: Necrotising Gingivitis (NG); Necrotising Periodontitis (NP), Necrotising Stomatitis (NS)

Figure 2.4 2018 Classification of systemic diseases and conditions that affect the periodontal supporting tissues. Source: Abridged from Jepsen *et al.* (2018), Table 1, which was adapted from Albandar *et al.* (2018). See Appendix 2 for unabridged version and ICD-10 codes.

1. Systemic disorders that have a major impact on loss of periodontal tissues by influencing periodontal inflammation	2. Other systemic disorders that influence the pathogenesis of periodontal diseases	3. Systemic disorders that can result in loss of periodontal tissues independent of periodontitis
1.1 Genetic disorders 1.1.1 Diseases associated with immunologic disorders Eg Down Syndrome; Papillon-Lefèvre Syndrome; Chediak-Higashi Syndrome; severe neutropenia (congenital or cyclic) 1.1.2 Diseases affecting the oral mucosa and gingival tissue 1.1.3 Diseases affecting the connective tissues Eg Ehlers-Danlos Syndromes (types IV, VIII) 1.1.4 Metabolic and endocrine disorders Eg Hypophosphatasia 1.2 Acquired immunodeficiency diseases Eg Acquired neutropenia, HIV infection 1.3 Inflammatory diseases	Diabetes mellitus Obesity Osteoporosis Rheumatoid arthritis or osteoarthritis Emotional stress and depression Smoking (nicotine dependence) Medications	3.1 Neoplasms Primary neoplastic diseases of the periodontal tissues Eg Oral squamous cell carcinoma; odontogenic tumours; or other primary neoplasms of the periodontal tissues Secondary metastatic neoplasms of the periodontal tissues 3.2 Other disorders that may affect the periodontal tissues

Figure 2.5 2018 Classification of other conditions affecting the periodontium: periodontal manifestations of systemic diseases and developmental and acquired conditions. Source: Adapted from Caton *et al.* (2018), Table 4.

Systemic diseases or conditions that affect the periodontal supporting tissues (Albandar <i>et al.</i> 2018, Jepsen <i>et al.</i> 2018)	See Fig 2.4 and Appendix 2
Other periodontal conditions (Papapanou <i>et al.</i> 2018, Herrera <i>et al.</i> 2018)	Periodontal abscesses (Fig 2.6) Endodontic-periodontal lesions (Fig 2.7)
Mucogingival deformities and conditions around teeth (Cortellini and Bissada 2018)	Gingival phenotype Gingival/soft tissue recession Lack of gingiva Decreased vestibular width Aberrant frenum/muscle position Gingival excess Abnormal colour Condition of exposed root surface
Traumatic occlusal forces (Fan and Caton 2018)	Primary occlusal trauma Secondary occlusal trauma Orthodontic forces
Prostheses and tooth-related factors that modify or predispose to plaque-induced gingival diseases/periodontitis (Ercoli and Caton 2018)	Localised tooth-related factors (Fig 2.8) Localised dental prostheses-related factors (Fig 2.8)

Figure 2.6 2018 Classification of periodontal abscesses based on aetiological factors involved. Source: Adapted from Papapanou *et al.* (2018), Table 4.

Periodontal abscess in periodontitis patients (in a pre-existing periodontal pocket)	Acute exacerbations	Untreated periodontitis	
		Non-responsive to therapy periodontitis	
		Supportive periodontal therapy (SPT)	
	After treatment	Post-Professional Mechanical Plaque Removal (PFMPR)	Systemic antimicrobials Other drugs: nifedipine
		Post-surgery	
		Post-medications	
Periodontal abscess in non-periodontitis patients (not mandatory to have a pre-existing periodontal pocket)	Impaction		Dental floss, orthodontic elastic, toothpick, rubber dam, popcorn hulls
	Harmful habits		Wire or nail biting and clenching
	Orthodontic factors		Orthodontic forces or cross-bite
	Gingival overgrowth		
	Alteration of root surface	Severe anatomic alterations	Invaginated tooth, dens evaginatus or odontodysplasia
		Minor anatomic alterations	Cemental tears, enamel pearls or developmental grooves
		Iatrogenic conditions	Perforations
		Severe root damage	Fissure or fracture, cracked tooth syndrome
		External root resorption	

Figure 2.7 2018 Classification of endodontic-periodontal lesions. Source: Adapted from Papapanou *et al.* (2018), Table 3.

Endo-periodontal lesions with root damage	Root fracture or cracking	
	Root canal / pulp chamber perforation	
	External root resorption	
Endo-periodontal lesions without root damage	Endo-periodontal lesions in periodontitis patients	Grade 1 - narrow deep periodontal pocket in 1 tooth surface
		Grade 2 - wide deep periodontal pocket in 1 tooth surface
		Grade 3 - deep periodontal pockets in > 1 tooth surface
	Endo-periodontal lesions in non-periodontitis patients	Grade 1 - narrow deep periodontal pocket in 1 tooth surface
		Grade 2 - wide deep periodontal pocket in 1 tooth surface
		Grade 3 - deep periodontal pockets in > 1 tooth surface

Figure 2.8 2018 Classification of factors related to teeth and to dental prostheses that can affect the periodontium. Source: Adapted from Jepsen *et al.* (2018), Table 4.

Factors related to teeth/dental prostheses that can affect the periodontium	
Localised tooth-related factors that modify or predispose to plaque-induced gingival diseases/periodontitis	Tooth anatomic factors
	Root fractures
	Cervical root resorption, cemental tears
	Root proximity
	Altered passive eruption
Localised dental prosthesis-related factors	Restoration margins placed within the supracrestal attached tissues
	Clinical procedures related to the fabrication of indirect restorations
	Hypersensitivity/toxicity reactions to dental materials

Key points

- The current 2018 classification derives from the 2017 World Workshop on Classification of Periodontal and Peri-implant Diseases and Conditions and replaces the previous 1999 International Classification
- The 2018 classification:
 - defines periodontal health for the first time, as well as plaque-biofilm induced gingivitis and non-dental-plaque-induced gingival conditions
 - provides a new classification for periodontitis, including Staging and Grading
 - includes categories for periodontitis as a manifestation of systemic diseases and systemic diseases and conditions that affect the periodontal supporting tissues
 - updates other conditions affecting the periodontium
 - classifies peri-implant health, peri-implant mucositis, peri-implantitis and peri-implant soft and hard tissue deficiencies for the first time
- Knowledge of the current classification provides a basis for subsequent diagnosis and management of periodontal and peri-implant diseases and conditions